

Stray Notes on some of the smaller Crustaceans. Note I. On the Habits &c. of the *Hyperiidæ*. By THOMAS EDWARD, A.L.S.

[Read June 21, 1866.]

It would appear, from works on this department of the animal kingdom, that carcinologists are unanimously of opinion that the *Hyperiidæ* are parasitical in their habits. And in the most recent monograph on the subject we are told that the species are found to exist only in the gill-cavities of *Medusæ*, though they are also occasionally found on fish.

From this I in a great measure dissent. That some of the species are at times found in *Medusæ* I know. But is the *Medusa* their true habitat? I believe rather that, instead of being their natural abode, it is simply a place occasionally chosen for convenience' sake, or to suit existing circumstances as it were. But, since I have no wish to interfere with the ideas or researches of others, I shall in my remarks confine myself more particularly to what has come under my own observation.

Before discussing the habits of the species, I would here say a few words as to the sexes, so as to save time and useless repetition.

I consider the genus *Lestrignonus* of Milne-Edwards and subsequent writers to be nothing more nor less than the male of *Hyperia*. I am led to this conclusion from the remarkable similitude which exists among them, and from the fact that, in all the species (*five in number*) which I have met with, the sexes have always been associated, except in the case of *Lestrignonus Kinahani*. I have not, as yet, been able to detect a female for him, but have no doubt whatever of the others. It may here be mentioned that I speak only of those I have myself found. For my own part I have little or no difficulty whatever in tracing, almost from the ovary of the parent up to a state of maturity, *Lestrignonus exulans* as the male of *Hyperia galba*. The differences between the two are so slight as scarcely to be worth noticing, except perhaps in a sexual point of view. Their external appearance is almost the same, both in form and colour; and in habits they are wholly alike.

The same may be said of *H. olivia* and *H. medusarum*, the males of which have not yet been described, but both of which I have lately discovered, and which must, as a matter of course, be called *Lestrignonus*,—and also another species, believed to be new, and not yet named, and smaller than the last, which we shall here, but only for convenience' sake, as it is in the hands of another to

name, call *H. minuta*. The males of all these, I say, can be clearly and satisfactorily defined; at least, so it appears to me. So confident am I in this, that those I have in my own collection are so arranged, and marked male and female.

The only species (as I have already said) to which I have not yet been able to assign a female is *L. Kinahani*. I thought I had discovered the desideratum once; but unhappily the specimens were lost before the examination and comparisons were completed.

Although this species may be, and is occasionally, found in company with *H. galba*, the one is easily distinguishable from the other. They are nothing alike, either in form or colour; not to speak of the long and remarkably slender antennæ of the one in comparison with those of the other. *H. Kinahani* is longish, more shrimp-like, especially behind, and not so round and dumpy as *H. galba*, and the colour is always much darker. The eyes, too, are dark instead of being of a light green. I am speaking of the living animal; for the figures which I have seen all appear to me to have been taken from rolled up and contracted specimens.

From these circumstances, then, we shall, for the present, lay aside the term *Lestrigonus*—except in the case of *L. Kinahani*, which must remain as he is in the meantime—and adopt that of *Hyperia*, and, when referring to the sexes, simply use the designation of *male* or *female* as occasion may require.

I have already said that it is the general belief amongst carcinologists that the animals composing this family are parasitical in their habits, and have never been found but on the *Medusa* and on fish.

This does not exactly agree with my experience; for I have taken all the five species mentioned swimming free. I do occasionally find *L. Kinahani* and *H. galba* in a *Medusa*, but have never as yet met with any of them attached to fish.

But, as already observed, is the *Medusa* or even a fish their real and true habitat? I rather think not; and my reason is this: they appear to me, although they do occasionally come inshore, to be what I would call an out- or deep-sea and a wandering genus. Now, from this circumstance, I believe that on coming in contact with the gill-cavities of the *Medusa*, and finding them a convenient and, perhaps, in some measure a comfortable receptacle, some may for a time avail themselves of the opportunity thus afforded of being carried through the water at the expense of another.

I am not yet certain whether the two species alluded to be animal feeders or not. If they are, as I know others of the family to be, then they may have two other objects in view in affixing themselves on the *Medusa*—one being shelter from their enemies (if they have any), and the other to obtain food. It is not at all impossible, but, as I think, rather probable, that other and much more minute animals, or something else congenial to their tastes, may exist in certain species of *Medusa*, and that these may attract and afford them abundant and savoury food. When in these retreats, I have frequently observed, with the aid of a glass, that their swimming-feet, as well as, sometimes, the others, but more particularly the former, were kept almost continually in motion. I could also occasionally see the mandibles and other appendages of the mouth moving. This was particularly the case with *H. galba*. From these circumstances I have been at times led to conclude that they were then in the act of feeding.

But whether I am right in these conjectures or not, I know that they can and do leave the *Medusa* at will, or when occasion suits them. I have often seen them do so, both in the water and on the land. In the latter case, and when the *Medusa* has been stranded for a little, they will come out, and, toppling over and over, roll hither and thither in the most awkward manner; for decidedly they can neither stand on their feet, nor walk, nor even crawl. But should they in thus tumbling headlong about again by chance reach their own element, they will then dart away like an arrow, seemingly taking no count as to the fate of the gelatinous friend that bore them to the shore. I have also taken them from the *Medusa*, and placed both in a pool, to see if they would again seek to enter. On these occasions a few of the smaller would do so; but the majority never did. They invariably kept swimming about without paying the least attention to the *Medusa*, and if an outlet could be found, off they went once more to sea. I have myself, when the tide was rising, cut channels in the sand to allow the water to run in instead of out, to see how they would then act. It was all one whether the water came in or went out; for whenever they got to the opening, away they sped. Not content with this, I have taken them home to try them there; but although the *Medusa* thrive well enough for a time, the *Hyperia* never did; and, unlike the case of the rock-pools, under these circumstances I never saw any of them attempt to return to the *Medusæ*, but they kept continually

swimming about, sometimes rolling themselves up, and in that position would fall to the bottom, where, having lain for a little, they would start up and begin swimming again.

I could never get either of these forms to eat, although I have kept them for that purpose, and with the view of ascertaining what their food might be. They in fact seldom rested long enough to allow of anything of the kind. *Lestrigonus Kinahani*, however, always appeared more docile, if I may use the phrase, and was never so restless as *H. galba*. Yet the whole aim of both, however large the vessel in which they were confined, seemed to be to regain their liberty and be once more in the free ocean. This being denied them they generally died in about two days, and sometimes sooner. I have placed various substances (in addition to marine productions), such as wood, cork, &c., in the vessel with them, but I never saw any of them pay the least attention or attach themselves to anything. A few once, but it was only for a little while, concealed themselves in the folds of a piece of paper; but that was the only instance of the kind I ever saw. Restless apparently in manners, though not quite so active and wild as some of their congeners, still their constant habit, as I have already hinted, was to swim about, with the additional trait of rolling themselves up occasionally like a ball, sinking to the bottom, where, after resting for a little, they would again stretch themselves out and resume their former occupation.

But although I have stated at some length the facts concerning the *Medusa* and some of its so-called parasites, I am not inferring whether they prove or disprove anything—that is, whether the *Hyperia* be parasitical or not. That the experiments, as will be observed, were in most cases made at what may be called a disadvantage to the animals, I freely confess, also that they were done merely to satisfy my own insatiable curiosity. Still I consider the circumstances worth recording, especially where they may meet the notice of those who, like myself, take an interest in these things; for we not unfrequently see that what are at times considered to be nothing but worthless and insignificant incidents, often turn out in course of time productive of very important and valuable results. Something of this kind may accrue from my observations, as they may, I hope, be the means of stimulating others to investigate the matter more fully and with greater diligence.

It is also worthy of notice that, of the two species of *Hyperia* which I have found in the *Medusa*, *H. galba* has always been the

more numerous, and that by far the greatest number have been young and immature specimens. I have counted as many as thirty in one *Medusa*, and only a few of these were adults. In other instances, however, and that too of the most common occurrence, the numbers would vary from one up to about a dozen. But it must not be taken for granted from this that every *Medusa* has its *Hyperia*. This is by no means the case. I have seen multitudes without any.

As for *Lestrigonus Kinahani*, the forms so named are ever the fewest thus met with cooped up, and all have seemingly arrived at a state of maturity. I have never yet seen a young or small example of this species in a *Medusa*, but have taken them free. There appears to be little or no difference between the young and the old. They are both slender, and of a dark lead-colour, and both have the remarkable long and hair-like antennæ.

But besides these I have likewise taken *Anonyx Edwardsii*, *Dexamine spinosa*, *Atylus Swammerdamii*, *A. bispinosus*, *Eurydice pulchra*, and once a small specimen of *Portunus marmoreus* from *Medusæ*; yet who would ever think of calling these creatures parasitical? Carcinologists do not, neither will we—although some of them may have occasionally been seen taking a quiet ride on the back of some of the smaller *Medusæ*.

It will be seen from the foregoing that only two species, viz. *L. Kinahani* and *H. galba* (m. & f.), have been in a measure particularly alluded to. The others will form the subject of and be more fully treated in another Note.

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On the Surface-fauna of mid-Ocean. By Major SAMUEL R. I. OWEN, F.L.S., F.A.S.L., F.M.S.L., Associate of King's College, London.

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[PLATE V.]

No. 2.—FORAMINIFERA.

IN a paper read before the Society and published in vol. viii. of the 'Journal,' (page 202) I mentioned that I had found some genera of the Foraminifera living on the surface of the ocean. I wish in my present communication to give the names of the species and the localities in which I have met with these Rhizopods, together with such other observations on them as may appear worth